First of a Series on

FROM CAVE MAN TO CITY DWELLER

SCIENTISTS, BONES, AND TOOLS

by

EDITH FLEMING

Raymond Foundation

CHICAGO NATURAL HISTORY MUSEUM
RESEARCH AND EDUCATION
FOUNDED 1893 BY MARSHALL FIELD

Museum Stories, No. 314

March 2, 1957

Scientists, Bones, and Tools

How long is a thousand years? It is not half that long since Columbus discovered America. Jesus was born almost two thousand years ago. The Egyptians built the pyramids of Egypt nearly five thousand years ago. But the story of early man goes back hundreds of thousands of years. It begins in what we call prehistory because it happened before man knew how to read and write. Writing was invented only about 5000 years ago, and so most of man's story is prehistory.

How would you read a story without a book or without any writing? Special scientists called archaeologists are able to do this. They read the story by studying the stone and bone tools of early man and charcoal pieces from his fire, and they call on other specialists to study the bones of early man that have lasted through thousands of years.

Let's suppose that you are an archaeologist of the future, living thousands of years from now, and that you want to "dig" the city of Chicago. You might dig in the city dump where everyone's old broken dishes, old clothes, cars, and chairs had been thrown. The clothes and newspapers would have rotted away, but such things as a beefsteak bone and the steel blade from a carving set would have lasted, along with some broken dishes. If you think of all the things that would have fallen apart in the rain and snow or that would have rotted away, then you will have an idea of how hard the archaeologist of the future would find it to imagine what Chicago is like today if he had no written records to help him.

Now let us think of the scientists of today who dig up the things used by people who lived thousands of years ago. These people had very few things, and so their story would be even harder to read than ours.

Archaeologists are detectives. They have to find clues and fit them together to tell the story of early man. Before there were any archaeologists, people sometimes came across the tools of early man by accident. Perhaps when men were digging a well they found some chipped stones, or people

walking past a gravel pit would pick up an odd-shaped stone and take it home for a souvenir. About a hundred years ago scientists began to study these stones. Some of the stones looked alike. They were shaped in the same way. Scientists then realized that the stones must be the tools of early man. After a while, instead of picking up things here and there, a scientist would try to find a place where prehistoric men had lived. Then he would dig carefully, looking for the tools of these people and the bones of the animals they hunted.

Nowadays before the archaeologist begins to dig he studies everything he can find about the country where he is going to work. When Dr. Robert J. Braidwood of the Oriental Institute of Chicago went to Iraq in search of the earliest farming villages, he already knew the country and had decided that the well-watered hills would have been the best place for the earliest farmers to grow their crops. He went to the hill country and there he found, under layers of earth, the little village of Jarmo. Other scientists were with him. One could tell about the first crops the farmers had grown. Another could tell about the first animals to be tamed. Still another, by studying the bones of these early farmers, could tell what the people looked like. Working together, these experts were able slowly to figure out the life of Jarmo, one of the earliest villages in the world. By many such careful "digs" as this, the archaeologists have traced the story of early man.

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Second of a Series on

FROM CAVE MAN TO CITY DWELLER

EARLIEST MAN

by

EDITH FLEMING

Raymond Foundation

CHICAGO NATURAL HISTORY MUSEUM
RESEARCH EDUCATION
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Earliest Man

The story of man is not so long as that of the other animals. But he has progressed much further in a shorter time because man is an animal that can walk on two feet and because he has a good brain. The gorilla can stand up and walk a few steps, but then he has to drop down on all fours again. His hands are made for walking, not for doing things. Only man with his hands free for work can make tools and use them. Man can make whatever he needs to help him live comfortably anywhere in the world, in the tropics or in the Arctic. He can talk too and get advice from others. And he can pass on what he has learned to his children. That is why he has accomplished so much in a comparatively short time.

The story of man's beginning does not start with the gorilla or chimpanzee, as many people seem to think. Instead it goes back perhaps millions of years to some creature who was the ancestor of both modern apes and man. We can only guess about this long-ago creature, but if we come down in time to a million years ago we find that there were man-apes living in South Africa. Their skulls show that their brains were not much larger than the gorilla's, but the man-apes stood upright and walked on two feet.

In piecing together the story of early man we must travel to many parts of the world. First let us cross the Pacific to the island of Java. There, long ago, hundreds of thousands

of years after the man-apes of South Africa, lived apelike men. Their brains were larger than those of the man-apes of South Africa but much smaller than ours.

Let us take a side trip to Peking in north China to visit the relatives of Java men. We call them Peking men. They may have lived a little later than Java men and perhaps their brains were a little larger. But both groups had small brains, low foreheads, and no chins. Peking men lived in caves, and their bones, the ashes from their fires, and their tools have been found there. But these were not man's first tools.

Even the chimpanzee can use a sort of tool. Perhaps when you went to the zoo you saw a chimp pick up a stick and use it for a tool. But after he had used it he dropped it and forgot all about it. But man made the tools he needed. The first tools may have been pebbles broken to give a sharp edge. But each tool was different because there was no pattern. It took thousands of years for man to learn to make the same kind of tool over and over again.

Now let us travel to Europe to see what kind of tools they used there. No pebble tools have yet been found in Europe. But later in Europe, just as in Africa and the Near East, man made special kinds of tools. One was a large stone chipped on both sides, which we call a biface or handaxe. The other was made by striking chips, or flakes, from a piece of stone and using the flake as a tool. These two kinds of tools were used for many sorts of work. But the same man used both kinds, just as your father uses a screwdriver or a hammer, whichever he finds better for his work.

Much later than Java men and Peking men, people that we call Neanderthal lived in Europe and perhaps in Africa and Java. They did not look quite like us, but their brains were as large as ours. They lived in the mouths of caves, and because they were not very good housekeepers, we know something about them. What they did not want they threw on the floor of their cave. During thousands of years, layer after layer of discarded bits piled up. Archaeologists digging in this rubbish have pieced together the story of these people.

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Third of a Series on

FROM CAVE MAN TO CITY DWELLER

HUNTERS OF THE LATE ICE AGE

by

EDITH FLEMING

Raymond Foundation

Museum Stories, No. 316

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Hunters of the Late Ice Age

During the early part of man's story the climate was very changeable. Four times great ice sheets covered large parts of Europe, and between these cold periods the weather warmed up. It was at the time of the last ice sheet that modern man—that is, men like those we know today—lived in Europe. We speak of this kind of man as *Homo sapiens*, which means "wise man," for modern man has a good brain.

Man in those far-off days needed a good brain to help him, for the earth was not at all a comfortable place. It was bitterly cold, with frozen treeless barrens. Man lived in the mouths of caves and had a good fire to warm him and keep off wild animals. If there was no cave, perhaps he made a skin tent, or he might have made a sort of house by digging in the loose soil and roofing the hole with skins and sod. Inside, the cold could not reach him.

Of course people needed clothes to keep warm, and so the women made them of animal skins. The clothes have disappeared, but scientists looking in places where these people have lived have found bone needles that tell the story.

Giant animals, such as the woolly rhinoceros, the woolly mammoth, the cave bear, wild horses, bison, and reindeer, gave man his food. It must have taken courage to hunt these great

beasts. Man made many tools to help him. He had a whole tool-kit of stone blades. Some were dulled on one side so that they could be handled without danger. There were scrapers for cleaning animal hides, and besides all these there were tools for making other tools of bone as well as of stone.

But though man had invented many new tools and weapons, they were poor and weak beside the great animals to be hunted. Again man had to use his brain. He organized hunting bands and pitched his camp near the trails that he knew the animals followed from the winter feeding-grounds to the summer pastures. First he chose a valley safe from the blizzard winds. Then he looked for a gully near the trail where he could trap the animals for the kill. Great piles of bones in such places tell that man's plan for hunting was good.

During this time many small groups of people were scattered over the Old World. These groups had their special way of life depending on the kind of country, the weather, and the animals. Some hunted wild horses in central Europe; later others followed the reindeer. In France and Spain were many caves where people could find shelter, and here they left their tools and weapons. We know that these people were fishermen because there are fishhooks and harpoons.

Each little group of hunters with their wives and children moved about following the game. Sometimes they must have met other groups like themselves. From them they might learn of a new tool, or perhaps they traded one of their own for shell jewelry from the Mediterranean. These shells have been discovered as far north as central France, and flint for making tools has been found as far as seventy miles from the place where the flint was mined.

Besides being splendid hunters these people were very fine artists. They worked out a way of living that was well suited to the cold Ice Age, and the great animals they hunted gave them everything they needed. But nature interfered. The climate grew warmer, the great cold-weather animals died off or moved farther north, and the way of life of this early hunting people came to an end.

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Fourth of a Series on

FROM CAVE MAN TO CITY DWELLER

CAVE ART

by

EDITH FLEMING

Raymond Foundation

Museum Stories, No. 317

March 23, 1957

Cave Art

Man's life in the late Ice Age was hard and uncertain. The skill of the hunter was all that stood between him and starvation. The big game-animals that he hunted gave him food, clothing, tools, fuel for his fire, and even oil for his lamps. No wonder he used all his powers to help him in the hunt. He turned out new tools and practiced with them. He studied the habits of the animals. He even used magic.

Deep in the dark passages of caves, sometimes two miles in, artists drew lifelike magical pictures of the animals, large fierce animals—bison and wild bulls, fleet horses and nimble deer. Sometimes the artists painted a dart piercing the animal's side, for they felt that by killing the animal magically in the painting they would give the hunters power over it.

It took a brave man to go into the dark caves. If the cave was in wooded country, the artist might have lighted his way with a flickering torch. If there was no wood, he may have used a lamp made of a hollowed-out stone filled with animal fat, with a bit of moss for a wick. The light from such a lamp was very dim. The artist would have to grope his way through the dark cave-tunnels. Often there was danger of his getting lost and never finding his way back to the daylight. Wild animals might pounce on him out of the dark. A sudden draft might blow out his light or water dripping from the roof put it out. Stalactites, or stone icicles, hanging from the ceiling cast weird, frightening shadows. But none of these things stopped him. Perhaps he felt that all these dangers would make his magic more powerful.

These long-ago artists made their paints of iron ores and charcoal. They ground the colors smooth on a flat stone or on the shoulder-blade of one of the great animals that they hunted. Then they mixed the color with animal fat to make an oil paint that has stayed bright through all the years. One of the simplest designs the artist put on the cave wall was the outline of his hand, the hand that drew the magic pictures. He put his hand against the wall and blew red or yellow

powder over it. When he took his hand away, there was its pattern on the wall. And there it is to this day. Often he etched the outlines of animals and chiseled them out of the rock. Sometimes he made clever use of rounded sections of the wall to form the animal's body and then added head and legs.

But perhaps the most wonderful of all are the many colored pictures of game animals that he painted. Lifelike red-brown buffaloes stamp across the roof of a cave. Or wild horses run off into the distance of a narrow tunnel, and great black bulls stand with lowered heads. Some of the work is so high on the wall that a man could not reach it. Perhaps the artist used a scaffolding, or perhaps he stood on the shoulders of one of his helpers while he painted.

In the caves of Lascaux and Altamira and other caverns in southern France and northwestern Spain you can still see these paintings. They were made thousands of years ago at the time of the great ice sheets, but they rank among the great paintings of the world. They are thrilling pictures of life and power, perfect in every detail. Looking at them you can almost feel the strength of these great animals and sense the dangers of the hunt, when man with his crude stone tools dared to face these fierce wild creatures of long ago.

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Fifth of a Series on

FROM CAVE MAN TO CITY DWELLER

AFTER THE ICE AGE

by

EDITH FLEMING

Raymond Foundation

Museum Stories, No. 318

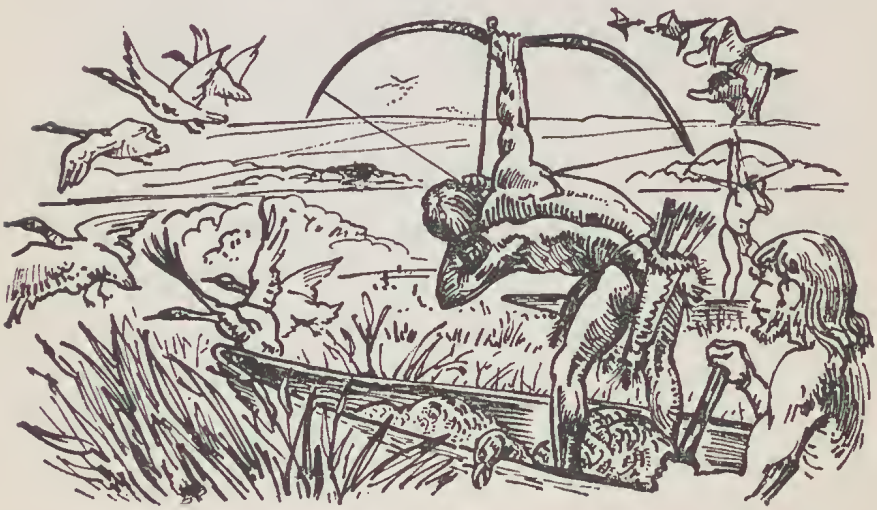
March 30, 1957

After the Ice Age

You have read how many thousands of years ago in the Ice Age large parts of Europe were covered with ice sheets. Then the climate grew warmer and the ice began to melt. Water from the glaciers rushed away in swift rivers and formed great lakes and marshes. It even raised the level of the ocean, and England and Ireland, which had been part of the continent, became islands. Willows, which like to grow in wet places, sprang up and, later, pines and oaks, until thick woods covered what had once been a frozen tundra.

It was too warm and there were too many trees for the great cold-weather animals, which moved northward and finally died. In their places deer and wild boars roamed through the woods. Man had to change his ways of hunting, for the old pits and ambushes where he had driven the great animals were no use against the small swift animals that often lived alone and must be hunted singly. He made new weapons, the bow and arrow, and he barbed his harpoon and spear with tiny points of flint called microliths or pigmy points.

In the new climate people lived differently too. There were more kinds of food: seeds, nuts, and berries. More people could live together. Groups of families camped each year where they knew they would find berries or nuts or where there were birds or fish to be caught. Each group worked out



a way of life that was suited to the special kind of country it lived in and followed the same pattern year by year.

A people we call Azilian lived in France and central Europe about this time. They may have been the descendants of the great hunters and artists of the Ice Age. But the great cave art had been lost together with the big game-animals, and the hunting magic had gone too. The Azilian people were simple hunters and gatherers. But they tamed the dog, which had probably been hanging around the camp hoping for scraps, and they taught it to help them in hunting.

Another group of people who lived about this time camped near a great swamp in Denmark. The swamp gave them their name, Maglemosian, but it did more than that. For in its soft mud the swamp preserved the tools and equipment of these people who lived so long ago. Scientists digging there have found all sorts of things that tell us how these swamp people lived, how they worked, and what they ate. Scientists have found axes, arrowheads, fishhooks, fish spears, and fish nets. And they know that these people must have had boats because there were wooden paddles in the mud. They have found bones of fish and wild birds too. All these things tell us that the Maglemosians lived in larger groups than the hunters of the Ice Age did, that they were fishermen, that they hunted water-birds with the bow and arrow, and that they used boats to move about in a country of lakes and rivers.

There were other groups that settled along the seashore and lived on shellfish. We know this because of the shells they left behind. They ate oysters and cockles and tossed the empty shells away. There the shells still lie, millions of them, in heaps large enough to cover a football field.

So you see there were many changes at the close of the Ice Age—changes in the country, in the weather, in the animals, and in the way that people lived and ate. People were learning to get the most out of the kind of region they lived in. And, without knowing it, they were getting ready for an even greater change—the time when they would learn to be farmers and could live in one place all the year round.

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Sixth of a Series on

FROM CAVE MAN TO CITY DWELLER

THE FIRST FARMERS

by

EDITH FLEMING

Raymond Foundation

Museum Stories, No. 319

April 6, 1957

The First Farmers

You know by now that the early hunters moved about following the wild animals and camped wherever they happened to be. The hunters had few possessions because they could not carry them around. There was little comfort in their lives.

But after a long time when the weather grew warmer things became easier. Wheat and barley grew wild in the fields, and when people learned that these seeds were good to eat they did not have to move about so much. Sometimes families could stay in one place for several months. At last, about six or seven thousand years ago, people learned to raise crops of wheat and barley and settled down as farmers.

Learning to farm was the greatest step forward men have ever taken, for it changed their whole way of life. They could live near their fields all the year round. It was worthwhile to build a house to live in and to make pottery dishes and weave cloth to make clothes. Men learned that they could tame animals instead of hunting them. There was time for other things, like making better tools and little figurines and even jewelry. People began to live in villages and everyone worked together to till the fields. All this first happened in the well-watered hilly country of the Near East.

One of the earliest villages we know about was Jarmo, a tiny farming community of probably only a dozen homes, with no temple or public building and not even a market place. The houses were made of mud with holes dug in the floors for ovens. To make the ovens safe the builders lined the holes with clay hardened by a fire built inside. Probably this is the first pottery ever made, but of course it could not be carried about the way we carry pottery dishes.

Perhaps it was the women who first learned to sow the wild wheat and barley seeds and reap the harvest with stone sickles. The men tamed the wild sheep, goats, pigs, and cattle that roamed the hills. There was no need to hunt, for they had a fine meat-market right at their door. They raised all their food and made their clothes and tools.

There must have been other little farming villages something like Jarmo dotting the hills of the Near East. Later the little farming villages spread farther and farther until at last they reached Europe. Many years after Jarmo, farming reached the Swiss lake country. The people who lived there built their wooden houses right over the water on piles. Sometimes they must have dropped their tools into the water from the pier. All these things sank into the mud at the bottom of the lake and stayed there through the years. Animal bones, pieces of charred cloth, apples, and wheat have been dredged up by archaeologists to tell the story of a little farming, fishing, hunting, and herding community of long ago that supplied all its own needs.

But the things that have been dredged up by the scientists from the Swiss lakes tell a different story from that of Jarmo. The Swiss lake-dwellers had already learned to live comfortably by hunting, fishing, and gathering wild fruits and berries, but they took on new ways slowly. When they learned about farming they raised crops, but they liked hunting better. We know this because the animal bones in the lakes belong mostly to wild animals and not to tame ones.

You may think that these villages were very tiny and the life very simple, but they were important. They mark the first beginnings of man's new way of life as a farmer, a life that was to change the ways of the whole world.

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Seventh of a Series on

FROM CAVE MAN TO CITY DWELLER

THE WORLD'S FIRST TOWNS

by

EDITH FLEMING

Raymond Foundation

Museum Stories, No. 320

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The World's First Towns

After the early people of the Near East had learned to farm and to tame animals they settled down to live in villages and built houses where they lived all the year round. Life was easier now, and the villages grew larger. There was good food for everyone. There were more children and healthier ones and the old people lived longer.

For many years people went on farming in the hills. Then they began to look around for more land for their fields. There was rich soil down in the plain between the Tigris and the Euphrates rivers. But it was terribly hot, and there were great swamps that never dried up and stretches of dry ground that were never watered. In spite of this, date palms grew wild along the banks of the rivers, flocks of birds lived in the marshlands, and there were fish in the rivers.

Now that the people were good farmers they could try to make the dry places and the swamps into farmland. It must have been hard work. No one could teach them about irrigation because no one had ever tried it before. People must have figured it out step by step. Working together in the broiling sun, men built earth embankments to hold the rivers in their places. They toiled over ditches that would drain the swamps and channel water to the dry places. At last the work was done. They had made new farmland. Then they had their reward. Seed planted in the rich soil grew and flourished far better than in the hills. Harvest came in the spring, for the summers were too hot for crops to grow.

The people kept on working to hold the rivers in place and to clear the irrigation ditches. This work could never be neglected, for if the mud settled in the channels the rivers might cut through the loose soil and flood the towns.

The farmers learned to put the oxen to work plowing. This was easier than in the old days when the women hoed by hand. The plowing went deeper and the work went faster, so that more fields could be planted. This meant extra food to be taken to the town to be sold. Men made wheeled carts for the oxen

to drag to market with the loads of fruit and vegetables. There the extra food was traded for pottery or cloth made by specialists who spent their time with their craft. These men did not need to farm, for now there was food enough and to spare. Creaking carts lumbered along the roads and sailboats plied up and down the rivers carrying jewelry, bright stones, pottery, and cloth from town to town.

Everyone worked together for the temple too, the finest building in the town. At first it was a simple place with mud walls, but after a while men discovered how to make bricks and then they began to think of new ways to make fine buildings for the gods. They plastered the temples with whitewash made of ground shells that glistened in the sun. Artists carved vases and figurines and ornaments for the temple. All the life of the town revolved around it. Men worked the temple fields and filled the temple storehouses with the harvest. Year by year the towns grew larger and richer. Some of them would in time grow into the first great cities of the world.

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Eighth of a Series on

FROM CAVE MAN TO CITY DWELLER

THE FIRST CITIES

by

EDITH FLEMING

Raymond Foundation

CHICAGO NATURAL HISTORY MUSEUM
RESEARCH AND EDUCATION
FOUNDED 1893 BY MARSHALL FIELD

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The First Cities

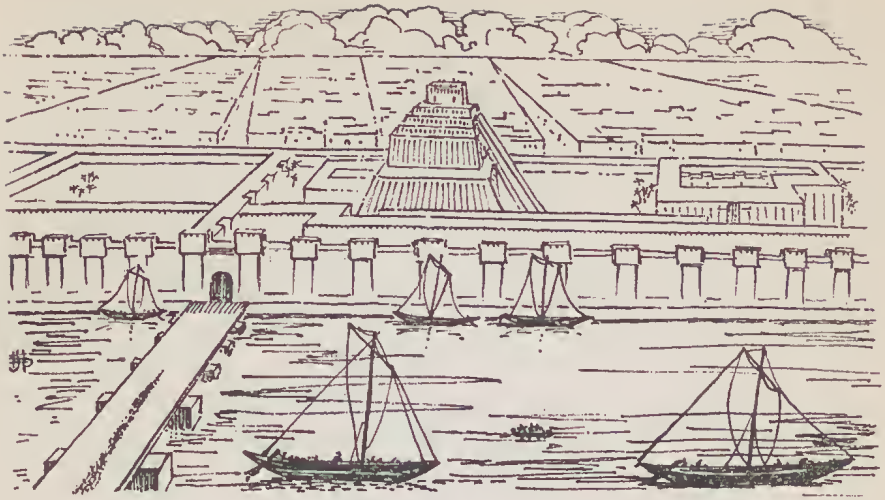
The early towns in the Tigris and Euphrates valley had been busy, but the cities that came later were still busier. The rivers were full of boats coming and going, and the wharves swarmed with men loading and unloading goods. For the first time civilization had come to the earth.

The word "civilization" comes from the word "city" but it means more than that. It means people working together on public works, such as irrigation and temples. It means specialists in pottery and weaving and metal-working because the farmer can raise enough food for everyone. And finally it means writing and law and the growth of nations.

With city life the irrigation ditches that had served the towns were too small. The ditches were deepened and widened and became canals along which boats brought the produce of the farms to the temple. The temple was the center of everything, with great storehouses and workshops where bakers and brewers, spinners and weavers, workers in metal, and potters toiled in the service of the god. There had to be records of all the riches, and so a system of writing was invented. People did not use paper but wrote on clay tablets with a wedge-shaped reed. This was the first writing.

There had to be schools to teach the clerks to read and write and to do arithmetic, which became important, as it is today, because everything that went into the storehouse had to be counted. Many things were bought and sold in the market place in front of the temple, and they had to be weighed and measured. In old days a man measured a length of cloth by his arm. But some people have long arms and some short ones. Standards had to be set up so that no one would be cheated.

With all the riches in the city, men began building larger and grander temples. Later they built ziggurats too, great mounds of earth that towered to the sky, in honor of the gods. Not all the materials could be found in the land of mud between the rivers. There was no stone and no metal. So merchants brought the needed things from the outside world and traded



them for fine cloth and pottery. Precious things came into the city from near and far.

Metal tools came into use, better than the old stone tools and easier to make. Bronze, made of copper and tin, was discovered about 3000 B.C. Bronze was used for ornaments, for decorations in the temple, and for weapons. For warfare came with civilization. Cities were jealous of each other. They built great walls to protect themselves and sent out armies to fight their neighbors. In time of war a war-chief ruled the city. Later this war-chief became the king. At last a great king, named Sargon, conquered all the cities of the plain and set up the first empire of the world.

Empires rose and fell as new and more dreadful weapons were invented. The war chariot drawn by horses was as frightful in those days as the army tank is today. But in spite of wars and conquests this civilization with its irrigation works, its art and architecture, and its writing flourished for many years in the land between the rivers.

A few hundred years after the beginning of civilization in the Tigris and Euphrates valley, another civilization arose in Egypt. It too was founded on irrigation, but Egypt had its own art and architecture, its own writing, and its distinctive way of life. These two great civilizations influenced those that followed in both Europe and America.

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Ninth of a Series on

FROM CAVE MAN TO CITY DWELLER

THE SPREAD OF CIVILIZATION

by

EDITH FLEMING

Raymond Foundation

CHICAGO NATURAL HISTORY MUSEUM
RESEARCH AND EDUCATION
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The Spread of Civilization

The Near East has been called the "Cradle of Civilization," for it was here that the first cities grew up. But cities, you know, do not keep to themselves. They influence all the country round about. People today flock to the cities to find work, to shop, and to sight-see. City business-men travel everywhere looking for new goods for their stores. There is constant coming and going.

It was like that with the ancient cities too. Everyone wanted to see the fine temples and palaces, and if visitors did not stay in the city, they went home to tell of its wonders and took with them the things for which they had bartered in the city. Conquering armies brought back riches and soon people began to expect new luxuries. Captives were forced to do the city's work. There was more time for the free citizens to work with arts and trade and warfare.

In the plain between the Tigris and Euphrates rivers and, a few hundred years later, in the valley of the Nile, great cities had grown up, each with its temples, its scholars, and its metal workers with their secret rites. These cities in their turn became centers from which spread the new ways of living and the new learning. The new cities were not just copies of the old cities, for each had its own specialty. Some were on the Mediterranean Sea instead of on rivers, and they built ships and sent their merchants to far places. Finally ships went as far as England and Ireland to find tin to make the bronze everyone wanted.

The sailors in their little ships liked to hug the shore, and they always touched at the island of Crete, which lies between Asia Minor, Egypt, and the mainland of Greece. The people of Crete began to do a good business in timber for ships, olive oil, and wine. The pottery jars of Crete filled with olive oil were sold along the coast of the Near East. Cities grew up on the island with fine buildings and palaces. Instead of irrigation works the people of Crete made good harbors to help in the shipping trade.

The demand for goods spread to the islets of the Aegean Sea between Asia Minor and Greece. The islets were too small for farming, but workers there mined copper and marble and exported them to the craftsmen of the cities. By degrees civilization spread farther and farther until it reached the mainland of Greece. Though the cities of Crete were conquered and destroyed, the new ways had taken root on the mainland and long afterward grew into the great Greek civilization.

The Phoenicians and later the Greeks were the great traders of ancient times. Business was so good that after a while the picture writing that had first been used was outgrown as too slow and difficult. The Phoenicians used an alphabet and the Greeks changed it to fit their language, and from it has come our alphabet. When a way to work iron was discovered, traders followed regular routes across central Europe, taking iron with them and by 700 B.C. using money for business.

But iron, the alphabet, and money do not make civilization. The people of northern Europe and England went on living much as they always lived until at last the Roman Empire conquered them. Civilization spread thinly from the Tigris and Euphrates to the Atlantic and from Egypt to England.

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